
CONSTRUCTION & PROFESSIONAL SERVICES MANUAL – 2004

CHAPTER 8: DESIGN DOCUMENT STANDARDS & REQUIREMENTS

SECTION 800.0 GENERAL

800.1 General Requirements: The A/E should be aware that there are differences between private work and work done for the Commonwealth of Virginia. These include:

- 800.1.1** The Commonwealth cannot limit bidding to a selected list of contractors known to do good work. Unless contractors are prequalified for the project in accordance with Section 1103.0, any licensed contractor may bid. Since the knowledge and experience of the contractors bidding on the project is an unknown, drawings and specification requirements must leave nothing to the imagination. They must be clear, concise, and provide thorough detailing of existing and proposed construction.
- 800.1.2** Sections, details, and dimensions must be in sufficient quantity, clarity and detail to allow the bidder to understand what is expected, to make takeoffs of material types and quantities, and, once hired to prepare shop drawings and execute the construction. This particularly applies to stairs, special connections for framing, typical details of system interfaces, flashings for roofs and walls, and similar building features. Details should clearly distinguish between existing and proposed/ new construction. Drawings must also clearly show and/or describe demolition requirements.
- 800.1.3** Project design is the sole responsibility of the A/E. Specifications which require the contractor to provide engineering design are not acceptable unless the products specified for contractor design are closed engineered systems. Closed engineered systems include: pre-engineered buildings, manufactured mechanical equipment, prefabricated trusses, and precast and common steel structural connections. Other systems can be defined as closed engineered systems if approved by the Director, Division of Engineering and Buildings.
- 800.1.4** In order to encourage competition required in the expenditure of public funds, performance specifications that define a desired result or assembly, or reference recognized standards to define a desired result or assembly, are strongly preferred. If performance specifications are not practical, and a manufactured product must be used to define a desired result of assembly, then three manufacturers and three products shall be referenced. Do not reference both manufactured products and performance criteria because conflicts in the performance criteria and the product performance create unnecessary conflicts. Sole source and proprietary specifications are not allowed without prior written authorization (*Code of Virginia*, § 2.2-4300 et al).

Failure to grasp these basic differences in rules and policies has been the source of many costly disputes, claims and document resubmittals by the A/E.

800.2 Project Aesthetics: The Art and Architectural Review Board's philosophy that good architecture can be achieved simply by good design which implies sensitivity to scale, massing, proportion, materials, detail and even color - none of which necessarily cost more should be kept in mind throughout the design. The Agency and the A/E must work together

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to achieve an aesthetically acceptable design which meets the special and functional requirements of the project within the stipulated design-not-to-exceed cost.

800.3 Project Identification on Documents: The Agency and the A/E shall show the 8 digit Project Identification Code (PC # = Agency Code + Project Code) on all plans, specifications, contracts, correspondence, sketches, invoices, memoranda, addenda and other documents related to the project. Where the project has been subdivided, also show the three-digit subproject identification code number. Example format: 999-99999-999. **Capital Project Documents without the required identification are not complete.**

Each page/sheet/sketch/drawing of any addenda shall show the A/E seal, the project title, the project code, the addendum number, the addendum date, and the page or sequence number to clearly indicate that the material is a part of the contract documents.

The A/E shall require the Contractor to show the Project Identification PC# on all submittals including invoices, schedules, shop drawings, change order proposals, correspondence and other project documentation.

800.4 Capital Project Initiation: The Agency will be authorized to initiate the design of a Capital construction project upon receipt of an approved GS Form E&B CO-2. Depending on the project documentation previously submitted and the action wording on the CO-2, one or more of the following design progress phases for review by the Division of Engineering and Buildings may be required.

- Schematic Design/Project Criteria
- Preliminary Design/Design Development
- Working Drawings/Construction Documents
- Revised Working Drawings

Minimum requirements for data, drawings, specifications, and cost estimates to be included in the submittal for the indicated phases are described in this chapter and the referenced Appendices.

SECTION 801.0 NON-CAPITAL OUTLAY CONSTRUCTION PROJECTS

801.1 General: Construction or improvement projects undertaken on state property which are not classified as Capital Outlay projects are not required to follow the capital outlay (CO-2, CO-4, CO-5, CO-6 and CO-8 submittal and approval process. However, the Non-Capital Construction Projects are subject to review and permitting by the State Building Official (the Director, Division of Engineering and Buildings) for conformance to the Virginia Uniform Statewide Building Code including its referenced standards and for the technical standards and policy requirements of the **Manual**. “Changes in Use Group Classification” of existing state owned buildings also require the submittal of information for the review and approval of the State Building Official and issuance of a new Certificate of Use and Occupancy.

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801.2 Projects/Work on state property shall be designed by and the documents sealed, signed and dated by Virginia licensed Architect(s) and/or Engineer(s). Working drawings ready for bidding and an Application for Building Permit (CO-17a) shall be submitted to the Building Official (DEB/BCOM) for review and issuance of a Building Permit.
(Agencies see Chapters 12 and 15 and the “Building Permit Policy” in Appendix P for further information.)

Some interior renovation or modification projects which do not involve a Change in Use Group Classification or projects to alter systems regulated by the USBBC may be permitted under the Building Official’s Annual Permit to the Agency. (See Appendix P) The Agency shall follow the procedures and keep records of such work as set forth in the Annual Permit issued to the Agency.

801.3 The Non-Capital Construction Project Work shall be inspected by a licensed Architect or Engineer, or by other qualified and approved inspector, for conformance with the VUSBC as shown on the approved plans and specifications. The Agency shall submit the CO-13.1a, the CO-13.2a, the Fire Marshal's report and recommendation, and other applicable certificates or reports along with the Form CO-13.3a, Application for a Certificate of Use and Occupancy, to DEB/BCOM when requesting that a Certificate of Use and Occupancy be issued.

801.4 If the Agency proposes to change the Use Group Classification of a building or a portion thereof, the VUSBC requires that a new Certificate of Use and Occupancy be obtained. The Agency shall bring the building into compliance with the current VUSBC requirements for the new use or, alternatively, shall have the building evaluated by a licensed Architect or Engineer for conformance with the requirements of Chapter 34 of the VUSBC. A copy of the Chapter 34 evaluation signed by a licensed Architect or Engineer shall be submitted along with copies of small-scale floor plans, a Fire Marshal's report, and a Form CO-13.3a, Application for a Certificate of Use and Occupancy, to DEB/BCOM requesting issuance of a Certificate.

SECTION 802.0 DRAWING STANDARDS

Contractors, Subcontractors, Suppliers and Vendor bidders rely on bid documents for State Agency building related projects to be consistent in format, presentation, terminology and terms and conditions. Conformance with the standards in this Chapter provides that consistency. Creativity should be reserved for the project design, not the preparation of the construction documents. The following clarifies the requirements, standards, and expectations applicable to drawings prepared for bidding and construction on state projects.

802.1. General Requirements

802.1.1 The Title sheet(s) shall clearly indicate the following information:

- the Project Title and Project Code;
- the activity or function(s) to be performed in the facility;
- the version (date) of the VUSBC on which the design is based;
- other major code used as a basis for design;
- Use Group Classification(s);
- maximum VUSBC occupancy for each level and total for the building;

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- VUSBC Classification of Construction and Type;
- Area for each floor and for entire building and volume of building;
- Predominate Floor Design Live Loads;
- Index of Drawings;
- Location and Vicinity Maps;
- Seals of the responsible Architect and Engineers, signed and dated

802.1.2. Indicate the number of beds (dormitory or hospital), fixed seats (auditorium) or parking spaces (parking deck), and other information relating to capacity of the facility as applicable.

802.1.3. Provide a master listing of all applicable abbreviations and symbols used in the set of drawings or provide a listing of all common abbreviations and symbols at the beginning of the drawings and provide a listing of the discipline specific abbreviations and symbols at the beginning of each discipline.

802.1.4. Building Floor Plan drawings for all disciplines shall be oriented the same to avoid confusion and to facilitate overlaying of drawings.

802.1.5. Topographic and site drawings shall conform to the approved site plan and shall show building location by dimensions, present and approximate finished grades, roads & walks, temporary & permanent erosion and sediment control devices, and stormwater management facilities.

802.1.6. Foundation and floor plans shall be drawn to a scale not less than $1/8" = 1'-0"$ with all necessary dimensions shown.

802.1.7. Roof plans are preferred at $1/8" = 1'-0"$ scale; however, roofs without mechanical equipment and metal / shingled pitched roofs may be drawn at a $1/16" = 1'-0"$ scale.

802.1.8. Foundation, floor and roof plans shall show all permanent equipment vents, utility or pipe penetrations, openings and such items affecting the construction.

802.1.9. Information plans to scale shall be furnished to BCOM and the Agency to clearly show the location and arrangement of built-in equipment/casework and of the furniture, fixtures, equipment, etc., which influence the location of utilities, including electrical, plumbing, heating, etc., and the assignment of space within the project.

802.1.10. Reflected ceiling plans shall show space numbers, locations of lights, HVAC items, sprinkler heads, speakers, smoke detectors, etc.

802.1.11. Design live load capacity for all floors and the roof in pounds per square foot shall be noted on structural floor plans.

802.1.12. All elevations shall be drawn to scale at not less than $1/8"$ to $1'-0"$.

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- 802.1.13.** A minimum of one transverse and one longitudinal section through the building shall be shown along with as many additional sections as are needed for understanding the plans. Include necessary dimensions on each.
- 802.1.14.** Typical wall sections shall be drawn at not less than $3/4" = 1'-0"$ scale.
- 802.1.15.** Typical window, door and special opening details shall be drawn at $1\ 1/2" = 1'-0"$ scale or larger.
- 802.1.16.** Provide all necessary interior and exterior details, including special doors, windows, woodwork, paneling or other decorative work, toilets and washrooms, etc., with plans and elevations at a minimum scale of $1/4"$ to $1'$ and with construction details at a minimum of $3/4"$ to $1'$.
- 802.1.17.** Provide stair sections for each stair configuration including dimensions, sizes, framing members, components, and any special details required.
- 802.1.18.** Door schedules shall include door number, label or type, size, material, frame, lintel, remarks. Also provide elevation and detail references.
- 802.1.19.** Window schedules shall include make or type, size, material, lintel remarks. Also provide elevations and details, if required for complete description.
- 802.1.20.** Finish schedules shall include space or room number, space name, floor finish, wall type/finish, ceiling type/finish, ceiling height, base, wainscot, remarks, and other columns, if required.
- 802.1.21.** Mechanical equipment room plans shall be drawn at $1/4" = 1'-0"$ scale minimum.
- 802.1.22.** Provide one longitudinal section and one transverse section through the building (minimum) to show mechanical work with relation to the work by other disciplines.
- 802.2. Arrangement of Drawings:** Drawings shall be arranged in the following order with the discipline identifying character shown:
- T - Title Sheet and Index
 - C - Plot and/or Site plans
 - C - Sanitary and Civil
 - B - Boring logs
 - L - Landscaping
 - D - Demolition
 - A - Architectural
 - S - Structural
 - FP- Fire Protection Information
 - SP- Sprinkler Systems, Standpipes, and Accessories

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- P - Plumbing
- M - Mechanical (heating, cooling, ventilation, etc.)
- E - Electrical
- R - Asbestos Abatement

802.3 Sizes of Drawing Sheets: Drawing sheet size, except in special cases approved by the Director of BCOM, shall be 24" by 36" (preferred) or, alternatively, 30" by 42". Drawings shall be prepared so as to be suitable for microfilming and for making clear, legible half-size reproductions.

802.4 Drafting Media: Completed manually drawn working drawings will be in pencil or ink on polyester drafting film with a minimum base thickness of .004 inch matted both sides. The A/E must furnish his own drafting film.

Completed computer generated working drawings shall be in ink on vellum or on drafting film (as selected by the A/E) suitable for reproduction.

Record drawings showing the As Built conditions shall be provided to the Agency/Owner on polyester drafting film with a minimum base thickness of 0.004 inch (4 mil) matted both sides.

802.5 Orientation: It is customary for a building plan to be oriented with the main entrance toward the bottom or right edge of the sheet, depending upon the building shape. All plans shall have a North Arrow for orientation.

All discipline building plans shall be consistent in orientation insofar as practicable. See paragraph 802.1.4 above.

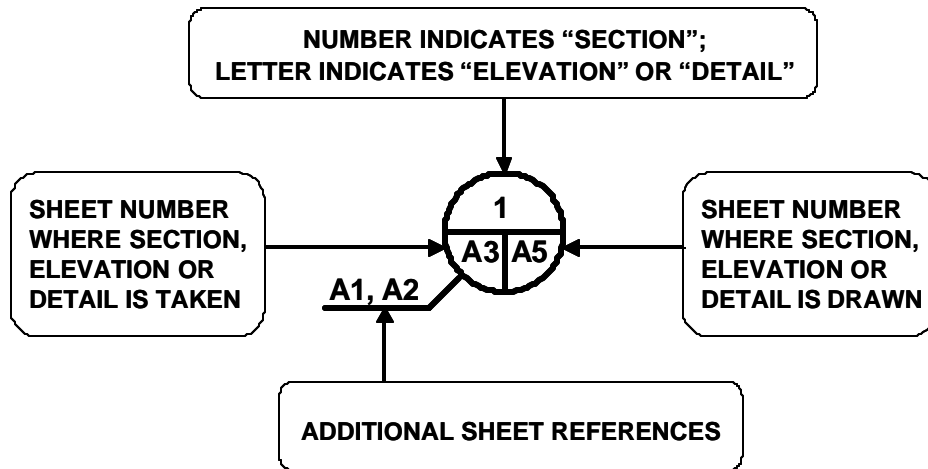
802.6 Lettering: The Division of Engineering and Buildings uses a microfilming system file for archival retention of construction drawings.

Unnecessary letter embellishments, poor spacing, careless lettering, weak lines, and lettering which is crowded or too small result in illegible films and poor reproductions. The minimum height for hand lettering on all projects shall be 1/8". Mechanical (typed or CADD) lettering shall be 1/10" minimum and in all caps. Make minimum gap between lines equal to one-half the letter height. Lettering and line weight must be in accordance with the above.

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802.7 Section and Detail Designation: The standard section symbol below will be shown both where the section or detail is cut and where the section or detail is drawn.



STANDARD SECTION, ELEVATION OR DETAIL SYMBOL

NOTE: SYMBOL SHOULD ALWAYS APPEAR AS PART OF TITLE, PLACED UNDER THE VIEW

802.8 Scales: An indication of the scale of the object drawn shall be located directly under the title of each plan, elevation, section, detail, etc. (Example: Scale 1/8" = 1'-0"). Closely related groups of details having identical scales and tied together with a common title may receive a single indication of scale under their title. Each drawing shall, as a minimum, have a graphic scale shown for the predominant scale used on that sheet.

802.9 Drawing Numbers: Drawings shall be sequenced by discipline letter (as indicated in paragraph 802.2) and number, i.e., A-1, A-2, A-3.1, A-3.2, S-1, S-2, etc.

802.10 Relation of Drawings and Specifications: Drawings generally indicate the scope of work, locations, relationships, and dimensions while specifications generally indicate quality, performance and installation requirements. Drawings and specifications shall supplement each other and must not conflict. Terminology used in specifications and drawings should be the same.

802.11 Boring Log Presentation: Boring logs representing soil conditions encountered in the site investigation including pertinent logs from previous explorations in the project location shall be presented on the drawing(s). Logs shall show the ground elevation, the depths of borings, depths and classifications/descriptions of materials encountered, blow counts per ASTM D-1586, ground water elevation, and other pertinent information. Boring locations relative to the project shall be shown on a small scale location plan or on the Site Plan. Boring logs may be photocopied to stick-on transparencies and securely and neatly organized on the Boring log sheet if legible and suitable for microfilming.

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802.12 Seals: Since working drawing submittals are, in the opinion of the A/E, complete and ready for bid, all drawings submitted for working drawing review shall bear the Virginia seal of the individual or individuals responsible for its design. See Chapter 3 for specific requirements regarding the application of seals and dates.

Asbestos drawings and specifications shall have the name, signature and Virginia license number of the asbestos project designer shown on each asbestos drawing sheet and at the beginning of the asbestos specifications section.

802.13 Date: All drawings and the specifications shall be dated with the **same date** which is established by the A/E as the date the documents are (or will be) complete, sealed and ready for bid. Documents printed for bidding shall bear the date described above with **no revision numbers or dates**. See Chapter 3 for specific requirements regarding seals and dates.

802.14 CADD Drawings on Diskettes: The Agency may require the A/E to prepare the drawings on CADD and to provide the Agency with one copy of the completed drawings on Compact Disks "CD" CD-ROM in "DXF" or "AutoCad Release 14" format **or other format specified by the Agency that is 100 percent compatible with the Agency's hardware and software**. The A/E shall provide the Agency with any special fonts, symbol libraries, special line types or line drawing software, or any other unique software required for the Agency to maintain the CADD drawings as current "As Built" documents.

802.15 Limits of the Work: The drawings shall describe/show the Work to be provided by the Contractor. Existing features, structures, or improvements to remain shall be so noted. Existing features, structures, or improvements to be demolished and/or removed shall be noted or identified. Work, improvements, demolition or construction which the Agency will perform or have performed by separate contract shall be identified as **"Not In Contract"** or **"NIC"** if the abbreviation has been defined.

SECTION 803.0 SPECIFICATION STANDARDS

803.1 General

803.1.1 Specifications shall clearly define the quality, performance, and installation standards for the Work and the conditions under which the Work is to be executed. They shall be in sufficient detail to describe without ambiguity, the materials, equipment and supplies, and the methods of installation and construction. Required tests and guarantees shall be indicated in the specifications.

803.1.2 Federal Specifications, MILSPECS, Corps of Engineers Specifications, and the like, often contain requirements or standards which are not applicable to state work. Those specifications also contain requirements and options ranging from the lowest quality to the highest quality product which must be carefully reviewed, selected and identified in the

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specifications. Therefore, the reference to Federal Specifications shall be avoided unless specific prior written approval is obtained from the Division of Engineering and Buildings.

803.1.3 The A/E shall use the latest published edition / revision of the General Conditions CO-7, Instructions to Bidders CO-7a, the Standard Bid Form format and wording, the Standard format and wording for the Notice of Invitation to Bid, and all other applicable CO Forms when compiling the project specifications. The latest editions are published on the DGS Forms Center at forms.dgs.state.va.us and may be downloaded / printed for use and inclusion in the documents.

803.2 Project Manual/Specifications Arrangement: Specifications shall be on 8 1/2" by 11" sheets with bid sets preferably printed on both sides of the sheet. Type print size shall be suitable for microfilming and shall not be smaller than 12-pitch type size. The table of contents pages shall be dated with the same date as the drawings and shall be sealed and signed. The Project Manual shall include:

- Notice of Invitation to Bid (Format in DGS-30-256)
- Instructions to Bidders (GS Form E&B CO-7a) (DGS-30 -055)
- Prebid Question Form (DGS-30 -272)
- Bid Form Format (DGS-30 - 220)
- Standard Bid Bond Form CO-10.2 (DGS-30-090)
- The current Commonwealth of Virginia General Conditions of the Construction Contract (GS Form E&B CO-7) (DGS-30 - 054) (See Section 803.3 below.)
- Supplemental General Conditions, if applicable (Samples in DGS-30 -376)
- Contract Between Owner and Contractor (GS Form E&B CO-9, DGS-30 - 064)
- Workers Compensation Insurance Certificate (GS Form E&B CO-9a, DGS-30 - 076)
- Standard Performance Bond (GS Form E&B CO-10, DGS-30 - 084)
- Standard Labor and Material Payment Bond (GS Form E&B CO-10.1, DGS-30 - 088)
- Change Order blank (GS Form E&B CO-11, DGS-30 - 092)
- Schedule of Values and Certificate for Payment (GS Form E&B CO-12, DGS-30 - 104)
- Affidavit of Payment of Claims (GS Form E&B CO-13, DGS-30 - 108)
- Certificate of Completion by Architect/Engineer (GS Form E&B CO-13.1, DGS-30 -112) and Certificate of Partial or Substantial Completion by Architect/Engineer (GS Form E&B CO-13.1a, DGS-30 - 116).
- Final Report of Structural Special Inspections (GS Form E&B CO-13.1b, DGS-30 - 120)
- Certificate of Completion by Contractor (GS Form E&B CO-13.2, DGS-30 - 136) and Certificate of Partial or Substantial Completion by Contractor (GS Form E&B CO-13.2a, DGS-30 - 140).
- List of Drawings
- Submittal Register Format (Sample in DGS-30-364)
- Structural and Special Inspections List (CO-6b, DGS-30 - 052)
- Division 1 - General Requirements, Special Conditions, etc.
- Technical Specifications (Divisions 2 - 16 Applicable Sections)
 - (a) Technical Specification Sections shall be numbered with appropriate five digit section numbers corresponding to the CSI Masterformat Broadscope numbering system.

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- (b) Technical Sections should, where possible, be subdivided into the Part I - General, Part II - Products, Part III - Execution format.
- Appendices containing Soils Report, Asbestos Report, Lead-based Paint Report and/or other information pertinent to the project but not a part of the Work. Such material should be noted as “INFORMATION ONLY” for use by the Contractor as he deems appropriate.

(See Sample Specification Table of Contents in Forms Center.)

803.3 General Conditions of the Construction Contract: The General Conditions of the Construction Contract, Form CO-7, is a standard document required to be incorporated in the documents for all building related construction, renovation, addition, and/or repair projects for which plans and specifications are prepared. The General Conditions (CO-7) have very significant legal implications and, as such, have been reviewed by the Office of the Attorney General.

No item of the General Conditions may be amended or deleted or its intent changed without prior written approval of the Director of the Bureau of Capital Outlay Management.

803.3.1 The A/E shall be familiar with the requirements and provisions of the General Conditions (CO-7) and the Instructions to Bidders (CO-7a) and shall coordinate the requirements in the Specifications with those in the CO-7 and CO-7a.

803.3.2 “Supplemental General Conditions” modify, amend or delete specific portions of the General Conditions. Where it is necessary to modify or amend a section of the General Conditions such as Section 11 or 12 with regard to amounts of insurance, or the use and amount of liquidated damages of Section 43, the changes shall be set forth and labeled “Supplemental General Conditions”, and shall be submitted to the Division of Engineering and Buildings for approval. See sample in Forms Center (DGS-30-376).

803.3.4 The use of “Liquidated Damages” is an attractive option and can be effective when properly used and administered. “Liquidated Damages” is not a penalty clause and does not guarantee that the project will be finished on time. Specifying “Liquidated Damages” has significant legal implications and risks for the agency. If the agency wishes to specify “Liquidated Damages”, the agency shall prepare a justification for doing so and attach documentation on how the proposed amount per day was determined and submit to the Director, DEB for approval.

803.3.4 The “Special Conditions” set forth specific requirements which are peculiar to the specific project. These include such items as hours of work restrictions, Contractor office and storage area restrictions, coordination requirements for utility interruptions, hazardous material data sheet submittals, and so forth. The Special Conditions shall be included in Division 1 of the Technical Specifications.

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803.3.5 The General Conditions (CO-7) may be included in the Project Manual by reference.

However, the Notice of Invitation to Bid and the Instructions to Bidders (CO-7A) must state where the General Conditions (CO-7) are available for inspection and from whom the prospective bidders may request and receive a copy of the General Conditions. The entity tasked with issuing the documents for bidding shall be listed as the source for obtaining a copy of the General Conditions if not included in the bid documents.

The latest published edition of the General Conditions, CO-7, shall be bound in the specifications or referenced. If incorporated in the bid sets by reference, a complete copy of the General Conditions shall be provided to any requestor at no charge. A complete copy of these General Conditions shall be included in the Documents attached to/referenced by the Contract Between the Owner and the Contractor (CO-9).

803.4 Instructions to Bidders, G.S. Form E&B CO-7a: The Instructions to Bidders, CO-7a, included in this **Manual** is a standard document which has been written to conform to the requirements and procedures of the Virginia Public Procurement Act, §2.2-4300 through 2.2-4377, *Code of Virginia*, and has been reviewed by the Legal Counsel. The Instructions to Bidders shall be reproduced and included in the Documents without modification. **They shall not be retyped.** The requirements and procedures delineated in the Instructions to Bidders have significant legal implications and shall not be changed without the prior written approval of the Director of the Bureau of Capital Outlay Management.

The persons at the Agency and the Architect/Engineer who are responsible for advertising for, receiving, and opening bids for the project shall be familiar with and conform to the requirements of the Instructions to Bidders, Form CO-7a.

803.5 Types of Specifications

The three types of specifications used on state projects are:

803.5.1 Non-proprietary and Performance Specifications

This is the preferred method of specifying materials, equipment and systems. A non-proprietary specification shall be written either as (a) a generic performance specification (preferred); or as (b) a specification naming a minimum of three manufacturers with model or series numbers.

- (a) A generic **performance** specification must be written to describe the required characteristics, performance standards, capacities, quality, size or dimensions, etc. of the item or system. A minimum of three manufacturers must be able to meet all requirements shown in the specification. The specification shall not be contrived to exclude any of the three manufacturers or to benefit any one manufacturer over any of the other manufacturers. The **performance** specification shall not name manufacturers or brand name products.
- (b) A non-proprietary manufacturer/model number type specification must list three manufacturers with their respective model numbers. Each of the listed

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manufacturers/model numbers must have been determined by the A/E to meet the specifications and be acceptable. If a named manufacturer prepackages or pre-assembles its item or system, the model number shall be specified. If the named manufacturer(s) custom builds the item or system, naming of model numbers is not required.

The manufacturer/model specification must **describe the required characteristics, performance standards, and capacities which will be used to determine equal products** as allowed by Section 26 of the General Conditions. Do not specify extraneous characteristics that do not relate to the products performance or suitability for the project. If only two acceptable manufacturers can be found and documented by model number but other equal products are acceptable if found by the bidder, the A/E may request permission from the Director, Division of Engineering and Buildings, to list only those two manufacturers but consider equals if proposed by the Contractor.

803.5.2. Proprietary Specifications: A specification is proprietary if it specifies a product / requirements which only one manufacturer can meet but the product is available from multiple vendors or sources. Although a proprietary specification should be avoided because it restricts competition, circumstances such as space limitations, mandatory performance standards, compatibility with an existing system, etc, may leave no other reasonable choice (see below).

Two typical situations that may require proprietary specifications are:

- when only two manufacturers or suppliers provide an acceptable product or system, when there are no equals and when no substitutions are allowed; or
- when there is only one manufacturer but two or more vendors or suppliers can purchase the material and compete to provide the product or system to contractors or bidders.

Proprietary specifications may be used when the agency requests and receives, in writing, authority from the Director of the DEB to use a proprietary specification. The agency must request authority as soon as the need for the specification is recognized, preferably in the preliminary design stage but definitely prior to submission of Working Drawings. The agency request shall explain why the proprietary specification is necessary. If approved to use a proprietary specification, the specification shall state that that “the product specified shall be used to the exclusion of all others and no other product will be considered to be equal.”

803.5.3. Sole Source Specifications: A specification is sole source when it names only one manufacturer or product to the exclusion of others, or when it is contrived so that only one manufacturer, product, or supplier can satisfy the specification. Because it eliminates all competition, it can be used only in the most exceptional circumstances and under the strictest conditions. A product, piece of equipment or service which is available only thru an area franchised vendor is also considered to be a Sole Source item.

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“It is the policy of the Commonwealth of Virginia that contracts be awarded on a competitive basis and that the use of a sole source procurement be limited to those instances where only one source is practically available which will meet the specific requirements of the project.”

The agency must obtain approval from the Director, Division of Engineering & Buildings to use a sole source specification / procurement for any and all items of material, equipment or services proposed to be included in the construction contract procurement. Submit the request to DEB using a completed GS Form E&B CO-18 with back-up and 4 point justification. The 4 point justification must address the following (by number and in order) in a direct and concise manner:

1. Explain why this is the only product or service that can meet the needs of the purchasing agency.
2. Explain why this vendor is the only practicably available source from which to obtain this product or service.
3. Explain why the price is considered reasonable.
4. Describe the efforts that were made to conduct a noncompetitive negotiation to get the best possible price for the taxpayers.

Prior to advertising the project for bids, the Agency shall either procure the sole source item and specify it as Owner furnished/Contractor installed or the Agency shall negotiate a fixed price for the item or system with the sole source vendor and require that the vendor provide the specified Sole Source Work as a subcontract to the bidder who is awarded the contract. In the latter case, the Bid Form shall show the vendor's name and the subcontract price for the item/system to be included in the Contractor's bid. See Sample Bid Form Format for required wording.

803.6 Virginia Manufactured Products: Pursuant to House Joint Resolution No. 3 of the 1984 Session of the General Assembly, when brand and/or manufacturers names are specified and one or more of those named are known to be Virginia based vendors, manufactured products, and/or contractors, those known Virginia based vendors, products or contractors shall be listed prior to listing non-Virginia based firms.

To further focus on the Commonwealth's "BUY VIRGINIA" emphasis, the IFB (or Project Manual) Cover shall be printed on the "BUY VIRGINIA" watermark/graphic shown on the 'IFB COVER FORMAT SAMPLE' located in the Forms Center.

803.7 Use of Standard or Guide Specifications: The use of standardized specifications or guide specs as a basis or resource for editing has many advantages for the A/E, the Reviewer and the Contractor. Performance guide specifications prepared by Masterspec, Spectext, the U. S. Navy and the Corps of Engineers are acceptable for editing. These guide specifications are available from the AIA, the CSI, the National Institute of Building Sciences in Washington, D. C., and other sources for use with various PCs and word processing programs.

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The A/E shall edit the guide specifications to include only the materials, requirements, and procedures applicable to the project. Specifications which are submitted without editing will be rejected as an incomplete submittal and appropriate notation made on the A/E's performance evaluation.

Where Navy or CE guide specifications are used on a project, they shall be edited to delete references to Military and Federal Specifications. References to the Contracting Officer should be changed to the Owner. Also, requirements for tests, inspections, visits to the manufacturer's plant, etc. which are not normally required for state projects shall be deleted.

803.8 Restrictive Specifications and Performance Requirements

803.8.1 The A/E shall not require samples, shop drawings, or similar materials to be submitted for approval prior to receipt of bids. The specifications must contain sufficient information to describe to the contractor and bidders the performance and quality standards that will be used to evaluate the submittals.

803.8.2 Number of years of experience, or time in business, shall not be specified as a basis for award of contract. This applies not only to contractors, but also suppliers of equipment.

803.8.3 Complex and/or sensitive systems such as locking systems, detention equipment and security control systems for prisons often require manufacturers with a proven history of reliable, operable equipment in special situations with minimal malfunctions, as well as subcontractors who are experienced installers of that manufacturer's products. In such instances, the Agency and A/E should develop the necessary documents to prequalify the manufacturers and/or subcontractors prior to bidding. The names of those prequalified shall be listed in the bid documents for use by all general contract bidders.

803.9 Specifying New Types of Materials Equipment or Systems: Projects for the Commonwealth are not testing grounds for new type of materials or equipment; however, the fact that a material is newly developed does not preclude its use if documentation of independent laboratory tests clearly show that the material will meet the applicable requirements for the project. The Director of DEB must approve such utilization as a 'trial' or 'pilot' use. Agency will be required to closely monitor the installation for compliance with manufacturer's instructions and conduct periodic inspections and report results to DEB.

Unless the manufacturer of a new material furnishes factual data sufficient to evaluate the material, it should not be considered for use. If a new material is considered for use, a competitive-type specification must be written to assure that a competitive, good-quality product will be obtained. The DEB Director may, where justified, authorize use of a new material, equipment or system for a particular project on a trial basis for observation/evaluation.

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803.10 Phraseology: Specifications must clearly indicate the requirements for the project. Words or phrases which are vague or may be interpreted more than one way often lead to problems during bidding or construction and result in change order claims/requests. The following instructions are intended to reduce common errors and conflicts evolving from interpretations of the specifications.

803.10.1 Under “Requirements”, do not say “the Work consists of ...”. Drawings should show the entire scope of the Work. If necessary to list certain parts, say “Generally, the Work includes...”

803.10.2 In lieu of reference to the accompanying drawings, use the words “as shown”, “as indicated”, “as detailed” or “as approved by ...,” “as directed by,” “as permitted by.....”.

803.10.3 There are two parties to the Construction Contract: (1) the Agency or Owner for whom the Work will be performed and (2) the Contractor who has the responsibility to the Owner for all Work in the Contract. Do not name which subcontractor will do the work (i.e., the plumbing contractor, the earthwork contractor, etc.). The Contractor is responsible for determining the packages of work for each subcontract. It is acceptable for certain specialty work to be performed by persons qualified, certified or licensed (if appropriate) and experienced in this type of work.

803.10.4 Do not use “etc.” This term is too indefinite for bidding and inspection purposes.

803.10.5 Minimize the use of cross references and in no case use paragraph numbers for this purpose. If necessary to refer to a particular paragraph, do so by its section number and title (e.g. Section 03300, Cast-in-Place Concrete).

803.10.6 Do not set up a paragraph in the various sections entitled “Work not Included.” Describe the work that is included under the respective sections.

803.10.7 Specifications should clearly delineate air conditioning ducts, heating ducts and piping systems which are required to be insulated. The phrase “insulating all ducts except in conditioned spaces” has resulted in differences of opinion and claim situations. All duct systems should be appropriately designated as supply, exhaust, outside air intake, transfer, relief, or return and further clarified by stating insulating requirements.

803.10.8 Do not confuse any and all; “Correct any defects” should read “correct all defects”

803.10.9 Do not confuse either or both; e.g., “Paint sheet metal on either side” should read “Paint sheet metal on both sides”. “Either” implies a choice.

803.10.10 Do not confuse “or” and “and”; e.g., “The equipment shall not have defects in workmanship and material.” The use of “and” in this sentence indicates both requirements must be met. e.g. “Additives that decrease strength or durability are not permitted.” The use of “or” implies either condition would disqualify the additive.

803.10.11 Do not use “and/or”. The courts have considered this phrase to be intentionally ambiguous and, therefore, claims are often rendered in favor of the Contractor.

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803.10.12 Use statements that are definite and contain no ambiguous words and phrases.

“Remove” implies to take away from its current location. If “remove” is used, the A/E must also indicate whether to dispose of, salvage or re-install the material “removed”.

“Reinstall” implies put existing back in indicated place. If “reinstall” is used, the A/E must also indicate that the Contractor must carefully remove the item, properly store it, and then “reinstall” the item at the appropriate time.

“Replace” implies removal of old material and furnish and install new material. The preferred wording would be to “remove” and “provide”

803.10.13 “Provide” is defined as “furnish and install”. When material or equipment is “furnished” by the Agency directly or under other contracts for installation by the Contractor, the term, “install” should be used; however, the Contractor may be required to “provide” foundations, fastenings, etc., for the installation. If the word “install” is used alone, the Bidder or Contractor has a right to assume, on the basis of the definition cited, that the Agency will “furnish” the materials in question.

803.11 Specifications on Diskette or CD-ROM: The Agency may require the A/E to provide the Agency with one copy of the final completed Divisions 1 thru 16 specifications including addenda on diskette or CD-ROM in one of the following formats - Microsoft Word (Version 7.0 or later) or WordPerfect (Version 5.2 or later). The Agency shall specify the software preference in its notice to the A/E.

803.12 Hardware Specifications and Schedules: Hardware specifications and schedules may be written to specify the applicable Builders Hardware Manufacturer's Association (BHMA) / American National Standards Institute (ANSI) standards and designations **or** the specifications and schedules may be written by specifying three manufacturers and model numbers for each item. In either case the specifications must give sufficient information of the type, size, function, finish, etc., for the vendor to know what is required and for the A/E to evaluate the submittals. Sample types of acceptable Hardware Specifications and Schedules are included in Appendix J.

SECTION 804.0 COST ESTIMATE STANDARDS

Detailed descriptions and requirements for cost estimates are provided in Appendix E. A detailed cost estimate consistent with the level of design is required from the A/E with each submittal. A Building Cost Summary form shall be completed indicating the estimated cost of each system included in the project. In addition to a printed copy of the Building Cost summary form and estimate backup/details, provide an electronic copy of the completed Building Cost Summary with each estimate. The system quantity, system unit cost and unit cost per building square foot shall be shown on the form. Backup estimating information, including quotes of estimated cost for major items of equipment or built-in systems, shall accompany the Building Cost Summary form. An independent cost estimate is required with the preliminary submittal. On large projects, where

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construction cost versus budget is in doubt, the Owner may also obtain an independent cost estimate based on the final plans and specifications.

SECTION 805.0 DESIGN INITIATIONS / PREDESIGN CONFERENCE

The Agency shall arrange for a Predesign Conference at BCOM for all Capital Projects. Participants should include the Agency's Capital Outlay/Construction Representative, the Agency Project Manager, the BCOM Review Team and the A/E's Project Manager and responsible designer in each discipline (architect, civil, structural, mechanical, electrical and others if needed). Where the A/E and the Agency Project Manager are both experienced in the CPSM process and the Agency determines that a Predesign conference is not needed for the project, the Agency shall notify the BCOM Director, in writing, of the decision. The Agency will be 'at risk' for any extra costs for BCOM services caused by failures to conform to the CPSM procedures.

The purpose of the Predesign Conference is to clarify to all parties involved the procedures, needs and requirements for the particular project. Therefore, it may be beneficial to all for an A/E providing services for the first time on state work to have the Predesign Conference before the fees and terms of the A/E Contract are finalized.

The following is a sample of topics that may be included in the Predesign Conference agenda:

- Introduction of Attendees
- Role of BCOM
- Authorized Communications
- Design not to exceed Construction Budget
- Proposed Design Schedule
- Requirements of the **Manual** related to the Public Procurement Act, Chapters 7-10 of the **Manual** and Fire Safety Reviews
- Clarification / Resolution of Budget Development Comments
- Submittal Contents
- Review Requirements
- Intent of Review Comments
- Waivers and Code Modifications
- Sole Source / Proprietary Specifications
- Use of Standard CO Forms and Formats
- Value Engineering
- Prequalification of Contractors
- Other Regulatory Reviews
- Design Approach
- Project Scope to include:
 - Functional layout requirements
 - Type of occupancy and activities to be housed
 - Capacity requirements of spaces and/or building
 - Exterior finish or appearance requirements
 - Interior finish requirements
 - Types of construction or materials required

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- Style and character of building desired
- Special considerations such as expansion
- Floor and Roof Live Load, Wind Load, and Seismic Criteria
- Special HVAC or environmental requirements
- Fuel Analyses & Selection
- Special electrical power or lighting requirements
- Schedule requirements for design and for occupancy
- Geotechnical data
- Site particulars and requirements
- A/E's questions and clarifications

SECTION 806.0 SCHEMATIC DESIGN/PROJECT CRITERIA

806.1 General Requirements for Capital Projects

Unless waived by the CO-2 Action Wording, a schematic design/project criteria submittal shall be made to DEB for review (usually within 120 days after the effective date of the Acts of Assembly, also referred to as the Appropriations Act, containing the project). The purpose of the schematic submittal is to further develop data, detail and scope including schematic plans, as well as verify the data and program contained in the Capital Project Request. The project scope established by the schematic design, as agreed to by the Agency and the A/E and as approved by DEB/DGS/DPB, shall become a part of the A/E Contract as further definition of the scope described in the Capital Project Request Data.

The Schematic submittal shall include an updated/current copy of the **DPB Form S-1, Project Scope Profile**, or a listing of the Assignable Rooms and Spaces, which was used as the basis for development of the Schematic Design.

A schematic review meeting with BCOM reviewers may be requested by the Agency after the review is completed to assist in verifying the design and program approach, the systems proposed for the project, and/or to resolve issues raised by the review of the Schematic submittal.

All review issues must be resolved before the A/E is authorized to proceed with the preliminary design.

806.2 Basis of Design Narrative: The Schematic Design shall include a Basis of Design Narrative which provides the following information:

- Capacity and type of occupancy
- Functions to be housed in the building
- Proposed building location on the site
- Exterior Circulation - How this project will work with other area facilities
- Areas and/or capacity required for various activities proposed for building

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- Indicate the type of construction proposed: fire resistive, protected or unprotected noncombustible, etc. and VUSBC Type #
- Outline description of basic materials
- Future construction or expansion to be accommodated, if any
- Style and character of building desired
- Structural Design Live Loads, Wind Loads, and Seismic Criteria used
- Type of foundation system selected
- A description of the types of HVAC systems being evaluated, estimated heating and cooling loads, fuels evaluated and fuel selected to be used
- Total square foot area per floor and per building
- Total cubic foot volume
- Number of beds, seats or parking spaces, where applicable
- Total estimated construction cost based on the schematic documents
- Total proposed project budget

806.3 Schematic Drawings: The following drawings shall be included as a minimum:

- Floor plans consisting of single line drawings of each floor layout showing space names, nominal room sizes, and circulation paths
- Roof plan
- Longitudinal building section with floor to floor and floor to ceiling dimensions
- Transverse building section
- Exterior elevation views
- Structural plan of a typical supported floor framing scheme and a typical section showing the proposed components of the floor system
- Orientation and approximate location of proposed roads, walks and parking on a site plan
- Any other information that would be of value to the Agency and the Architect/ Engineer reviewing the project.

806.4 Verification of Existing Conditions: The A/E shall visit the site and ascertain pertinent local conditions which must be addressed in the design.

SECTION 807.0 PRELIMINARY DESIGN (DESIGN DEVELOPMENT PHASE)

807.1 General Requirements for Capital Projects: Based on the previous approvals and direction, the A/E shall prepare the Preliminary Design consisting of drawings and other documents to fix and describe the size and character of the entire Project as to exterior appearance; foundation, structural, mechanical, and electrical system; materials; and such other essentials as may be appropriate. The A/E shall have visited the site and ascertained pertinent local conditions required to be addressed in the submittal. If any change from the information submitted at the schematic stage relating to the mix or amount of space occurs, submit new information in the format of an updated/current copy of the **DPB Form S-1, Project Scope**

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Profile, or a listing of the Assignable Rooms and Spaces which was used as the basis for development of the Preliminary Design.

807.2 Preliminary Cost Estimate: The A/E shall submit to the Agency an estimate of the construction cost of the proposed design without regard to available funds. The estimate shall relate only to the estimated bid amount for the construction shown and shall not include fees or unknown contingencies. The cost estimate summary shall include any built-in equipment, even if such equipment is bid separately. Any proposed additive bid items must be justified and indicated by a separately stated estimate amount. The cost estimate must indicate the derivation of the pricing for the estimate and shall, as a minimum, for an Architectural project, include the data required by Appendix E (Cost Estimate).

The A/E shall also submit a take-off of the building areas of new construction and of renovated space calculated in conformance with Section 701A.

Utilities, sitework, civil and other special projects such as boiler installation; a utility system; a road system; a water plant; a wastewater plant; a refrigeration or chiller installation; etc., must be estimated on a quantitative basis for the major components and a lump sum estimate for the remainder.

Preliminary submissions shall be deemed to be incomplete if the above are not included.

807.3 Review Process: The A/E shall prepare and submit to the Agency, in quantities specified, black line or blue line prints of all drawings together with copies of cost estimates, reports and other data as set forth below. After the BCOM and the Agency review the submittal, one set of review comments and/or marked copies of the documents will be provided to the A/E by the Agency for response and/or resolution.

The submittal documents along with the review comments and the agreed upon resolutions of the comments shall be the basis of the approval for the A/E to prepare the working drawings.

807.4 Preliminary Submittal Requirements: The following information, data and drawings shall be the minimum acceptable for a Preliminary submittal for a Capital Outlay Project:

- (1) Basis of Design Narrative describing the project scope, the functional and operational criteria to be met, the justification for the decisions or choices made, and any proposed deviations from the standards required by the **Manual**. See Appendix D.
- (2) Building Systems and Equipment Checklist. See Appendix D.
- (3) Project Cost Estimate by the A/E. Cost Estimate shall be assembled by Building System with level of detail commensurate with the level of design and material sizing at this stage. See Appendix E.

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- (4) An Independent Cost Estimate shall be obtained by the Owner. Cost Estimate shall be a detailed estimate assembled by Building System. See Appendix E.
- (5) Soils Report to include boring logs, geotechnical analysis and foundation design recommendations.
- (6) Calculations (1 copy to BCOM) from each discipline involved. Show design criteria, loadings, assumptions, evaluations and comparisons of alternative systems, cost factors and other considerations which support the systems selected and shown on the drawings. Provide Design Data required for Fire Safety review as required by Chapter 7.
- (7) Preliminary Drawings as described below.

807.5 General Requirements for Preliminary Drawings: Preliminary drawings shall show the following information unless such information is not applicable to the project:

Title Sheet(s)

- Project Identification: Agency, Project Code, Appropriation Act Number.
- Location and vicinity maps.
- Tabulation of floor areas (new and renovated), total area, volume.
- Tabulation of units: Number of parking spaces, auditorium seats, bedrooms etc.
- Listing of applicable codes with dates.
- Building Purpose/Occupancy.
- Use Group(s) per VUSBC.
- VUSBC Construction Type
- Occupancy Load(s) per VUSBC.
- Index of drawings.

Site Plans (site/improvement plan & composite utility plan minimum for new construction and additions; should be based on approved comprehensive Master Plan.)

- Scale and north arrow.
- New and existing contours affected by work.
- Floor and contour elevations.
- Applicable boundaries with survey computations.
- Dimensioned relationship of new work to boundaries and existing structures.
- Location of test borings.
- General parking and handicap parking.
- Handicapped-accessible routes
- Pedestrian traffic routes.
- Demolitions: structures, walks, utilities, trees, etc.
- Proposed landscaping (planting materials)
- Existing and new utilities:

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storm sewers, sanitary sewers, water supply, gas, steam distribution pipes and tunnels, electric and telephone poles and lines, hydrant locations and data on fire flow test.

- Site improvements such as fencing, lighting, etc.
- Typical paving section for proposed types/thicknesses.
- Identify/show special earthwork recommended and construction considerations noted in soils report.

Demolition drawings

For interior demolition

- provide information on work to be removed;
- note results of asbestos survey; and
- note results of lead based paint survey.

For total building demolition

- provide a floor plan showing building size;
- describe existing material /construction to be removed;
- show an elevation (drawn or photographic) of building;
- note results of asbestos survey; and
- note results of lead based paint survey.

Architectural drawings

Floor Plans (for each floor)

- Plans of each floor at 1/8" = 1'-0" preferred (1/16" = 1'-0" must be justified and have written approval of BCOM)
- Overall dimensions.
- Space names and/or numbers
- If the work is an addition, show the relationship of new to existing spaces.
- Distinguish new from existing construction.
- Show demolition on the architectural plans or separate plans.
- Indicate asbestos locations regardless of who removes it or how it is removed.
- Indicate all openings, entrances, delivery areas.
- Indicate handicap access and Areas of Rescue Assistance.
- Show scale and north arrow.

Roof Plan

- All proposed and existing drains.
- Roof slope: 1/4" per 1'-0" to drain minimum for all areas (unless waived for reroofing).
- Indicate slope (high to low) with direction arrows
- All new and existing equipment.
- All significant roof penetrations and structures.

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- Identification of materials on existing roofs.
- Typical roofing section identifying materials.
- Access to roof.

Exterior Elevations (Scale 1/16" = 1'-0" minimum).

- All openings: windows (including operable notation), doors, louvers, vents.
- Percentage of glass vs. gross wall area.
- Floor elevations (above sea level).
- Identification of all major finishes.
- All stairs, ramps, and railings.
- Rooftop equipment and structures.
- Expansion and control joints.
- Grade at the face of the building wall.
- Subsurface construction (dotted in).
- Existing and new work clearly distinguished.

Small Scale Sections (Scale: 1/16" = 1'-0" minimum)

- One longitudinal and one transverse section minimum.
- Show all floor levels on sections.
- Indicate ceilings in proper relation to floors.
- Method and extent of insulating exterior envelope.

Detail Sections (Scale: 3/4" = 1'-0" minimum)

- One section for each type of wall construction.
- Identify all major materials and components.
- Identify insulation and note "R" value.

Finish Schedule

- May be included in the Basis of Design narrative or on drawing. Indicate proposed finishes for all spaces. Note those existing finishes to remain.
- Give ceiling heights of interior spaces.

Furnishing/Equipment Plans

- Show all major equipment to approximate scale.
- Show all built-in furnishings to scale.
- Show on these plans or on separate furniture information plans, furniture/furnishings outlines that the space was designed to accommodate.

Structural Drawings

- Show Live Loads, Wind Loads, and Seismic Criteria used for structural design
- Show design bearing / support capacity (soil bearing, pile capacity, caisson capacity) for foundation system
- Foundation Plan indicating type & tentative sizes.
- Foundation details of improved bearing strata and other special requirements.

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- Floor Framing Plans of each level indicating type of system and tentative member sizes/depths and column spacing.
- Roof Framing Plan.
- Typical Section(s) of framing identifying materials, thicknesses, depths.
- Typical Section of floor system
- Details of connections to existing buildings, if applicable.
- Identify elements of proposed lateral force resisting system.

Fire Protection (FP) Information (See Chapter 7)

Fire Detection and Alarm Systems (See Chapter 9)

Fire Suppression Systems - Sprinklers (See Chapter 9)

Fire Suppression Systems – Clean Agent (See Chapter 9)

Sprayed-on Fire Proofing Design & Specification (See Chapter 9)

Fire Pumps (See Chapter 9)

Smoke Control (See Chapter 9)

Plumbing Drawings.

- Plans of each floor noting fixture locations and types. Indicate routing of main distribution lines with tentative sizes.
- Show general or schematic arrangement of all piping systems.
- Show location of water, sanitary sewer, storm sewer and sprinkler services to the building.
- Show tentative fixture schedule.
- Show location, sizes and types of Hot Water Heaters/ Heat Exchangers, Storage Tanks, and flues if required.
- Show gas piping layout and connected load, if applicable

Mechanical (HVAC) Drawings

- Plans of each floor showing single line duct layouts, tentative air (supply, return, exhaust) quantities, equipment locations, and layouts and general routing of heating/cooling piping.
- Show equipment schedules with tentative sizes, capacities, ID #, features, etc.
- Indicate locations and sizes of fans, pumps, compressors, conveyors, etc.
- Schematic layout and elevation of equipment room and/or central system showing configuration, tie-ins, etc. as necessary to describe system.
- Central heating or cooling plants, distribution piping, equipment.

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Electrical Drawings

(Power and lighting plans may be combined if product clearly conveys required information.)

- Lighting plans for each floor showing approximate fixture location, type, and lighting level required (in footcandles).
- Power distribution plans showing location of incoming service, generators, and panelboards.
- Show interface points for communications, fire alarm, EMCS and other pertinent systems.
- Floor proposed locations for receptacles, telephone outlets and switches.

SECTION 808.0 WORKING DRAWINGS PHASE (CONSTRUCTION DOCUMENTS PHASE)

808.1 General Requirements for Capital Projects: The A/E shall visit the site as necessary to ascertain pertinent local and site conditions. Based on the preliminary plans (Design Development Documents) including the review and the value engineering comments and resolution thereof, the A/E shall prepare the working drawings and specifications. The working drawings shall set forth in detail the requirements for the construction of the entire project and include the applicable bidding information. The A/E shall assist in the preparation of the bidding forms, the Special Conditions of the Contract, and the Contract Between Owner and Contractor, CO-9.

Specifications and drawings for any type of built-in equipment must be submitted with the working drawings for the building, whether or not such equipment is to be procured under another contract, in order that such work can be coordinated and bid on at the same time.

If any change from the information submitted at the preliminary stage relating to the mix or amount of space for institutions of higher education is made, the Agency shall submit new information in accordance with the format shown on the sample form entitled Project Space Profile.

The A/E shall include on the working drawings and in the specifications all necessary information to describe the components for the fire-resistive rated construction assemblies and fire protection systems needed to provide the necessary fire integrity of the structure for compliance with all applicable governing Codes.

808.2 Cost Estimate: The A/E shall submit a detailed Cost Estimate in conformance with the requirements of Appendix E - Cost Estimate, and advise the Agency of any adjustments to previous statements of estimated construction cost. The A/E shall submit a signed Building Cost Summary Sheet with the estimated cost of work covered by the working drawings and specifications and square footage of the proposed building data completed. If this data varies significantly from that shown on the Preliminary Cost Estimate, the A/E will attach an

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explanation to the working drawing Cost Estimate. For large projects, the Agency may choose to have an independent cost estimate made using copies of the working drawings and specifications. This may be beneficial in determining if the project is likely to be within budget and in determining sufficient clarity and detail of the documents for bidding.

808.3 Permits and Utilities: The A/E shall assist the Agency in filing the required documents for approval of governmental authorities having jurisdiction over the project. If the Contractor will be required to interface with, coordinate with, or obtain inspection or approvals from any local authority or utility, the requirements and the name and address of such entity shall be shown in the documents.

808.4 Calculations: Calculations must be organized, indexed, numbered and submitted for each discipline involved. Design calculations should indicate assumptions, considerations and factors involved in the design and support the design shown on the plans and specifications. Provide one copy of the completed design calculations of each discipline to BCOM and provide one copy to the Owner's facilities office.

808.5 Submittal Documents: Working drawings shall be complete, coordinated, and ready for approval to bid. The working drawings including the specifications shall bear a uniform date as described in this **Manual**. The drawings shall consist of Architectural and Engineering drawings in such detail as to show clearly the work to be performed. These drawings shall be planned to produce a set of plans with all disciplines coordinated to describe the work required. Architectural and engineering details shall be included on the drawings with cross references on both the plan and the detail sheets designating specifically the location to which the particular detail applies. Do not include details which do not apply to the particular project.

808.6 Working drawings shall show or provide the following information:

Title Sheet(s)

- Project Identification: Agency, Project Code, Appropriation Act Number.
- Location and vicinity maps noted to show project location.
- Tabulation of floor areas (new and renovated), total area, volume.
- Tabulation of units: Number of parking spaces, auditorium seats, bedrooms etc.
- Listing of applicable codes with dates.
- Building Purpose/Occupancy.
- Use Group(s) per VUSBC.
- Type of construction and VUSBC Type #
- Occupancy Load(s) per VUSBC.
- Design Floor Live Loads.
- Index of drawings.

Site Plans (site/improvement plan & composite utility plan minimum requirements for new construction and additions)

- Based on approved comprehensive Master Plan.

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- Scale and north arrow.
- New and existing contours affected by work.
- Floor and contour elevations.
- Applicable boundaries with survey computations.
- Dimensioned relationship of new work to boundaries and existing structures.
- Location of test borings.
- General parking and handicap parking.
- Handicap accessible routes
- Pedestrian traffic routes.
- Demolitions: structures, walks, utilities, trees, etc.
- Proposed landscaping (planting materials)
- Existing and new utilities: storm sewers, sanitary sewers, water supply, gas, steam distribution pipes and tunnels, electric and telephone poles and lines, and hydrant locations with data on fire flow test.
- Site improvements such as fencing, lighting, etc.
- Typical paving section of each type and thickness required.
- Identify/show special earthwork recommended and construction considerations noted in soils report.

Demolition drawings

For total building demolition, provide :

- plan of building with length & width dimensions,
- elevations (drawn or photographic) and cross section of building to be demolished,
- details of termination of demolition, underpinning, etc.

For interior / selective demolition, provide:

- floor plans showing existing partition, etc., and showing or describing existing material /construction to be removed
- information or estimates for bidding for work to be removed.

Architectural drawings

Floor Plans (for each floor)

- Plans of each floor at $1/8" = 1'-0"$ preferred (but not less than $1/16" = 1'-0"$).
- Show room/space numbers.
- Overall dimensions.
- If the work is an addition, show the relationship of new to existing spaces.
- Distinguish new from existing construction.
- Show demolition on the architectural plans or separate plans.
- Indicate asbestos locations regardless of who removes it or how it is removed.
- Indicate all openings, entrances, delivery areas.
- Indicate handicap access.
- Show scale and north arrow.

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Reflected Ceiling Plans

- Ceiling tile / grid layout
- Light fixture locations
- Sprinkler head locations
- HVAC diffuser and grille locations
- Coffers, drop soffits, changes in height or materials

Roof Plan

- All proposed and existing drains.
- Roof slope: 1/4" per 1'-0" to drains minimum (unless waived for reroofing).
- All new and existing equipment.
- All significant roof penetrations and structures.
- Identification of materials on existing roofs.
- Typical roofing section identifying materials.
- Access to roof.
- Indicate direction of slope (high to low) with arrows

Exterior Elevations

- Scale (1/16" = 1'-0" minimum).
- All openings: windows, doors, louvers, vents.
- Percentage of glass vs. gross wall area.
- Floor elevations (above sea level).
- Identification of all major finishes.
- All stairs, ramps, and railings.
- Rooftop equipment and structures.
- Expansion and control joints.
- Grade at the face of the building wall.
- Subsurface construction (dotted in).
- Existing and new work clearly distinguished.

Building Cross Sections (Scale: 1/16" = 1'-0" minimum)

- One longitudinal and one transverse section minimum.
- Show all floor levels / elevations on sections.
- Indicate ceilings in proper relation to floors.
- Method and extent of insulating exterior envelope.

Detail Sections (Scale: 3/4" = 1'-0" minimum)

- One section minimum for each type of wall construction.
- Identify all major materials and components.
- Identify insulation and note R value.
- One section with dimensions and details for each stair configuration.

Finish Schedule

- Indicate proposed finishes for all spaces. Note those existing finishes to remain.
- Give ceiling heights of interior spaces.

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- Show (or specify) all finishes, textures, colors, etc., required to be provided by the Contractor

Furnishing/Equipment Plans

- Show outline of all major equipment to approximate scale.
- Show outline of all built-in furnishings to scale.
- Provide elevations, sections and details as necessary to describe built-in equipment, casework and furnishings included in the work of this contractor.

Structural Drawings

- Unless indicated otherwise below, the structural drawings shall provide complete details of all structural components so that no additional structural design will be required for the preparation of shop drawings except for standard connection details and fabrication calculations.
- Show design live loads, wind loads, and seismic criteria used for design of structural systems per VUSBC Chapter 16.
- Engineered Design and details of Engineered systems such as Cast-In-Place Post-Tensioned Concrete, Precast Concrete Components, Steel Joists and Joist Girders, Pre-Engineered Metal Structures, and Shop / Prefabricated Wood Components may be required to be provided by the contractor. In this case, the structural drawings shall include complete loading information as well as all other performance or size constraints for the components.
- Structural drawings shall include plans at the same scale as the architectural plans. Details and sections shall be at a scale of not less than 3/4" to 1'.
- The plans, details and specifications shall completely define the structural system and any special conditions for the project.
- Foundation Plan indicating type & sizes.
- Foundation details of improved bearing strata and other special requirements.
- Floor Framing Plans of each level indicating type of system and member sizes/depths and column spacing.
- Roof Framing Plan.
- Typical Section(s) of floor and roof systems identifying materials, thicknesses, depths.
- Details of connections to existing buildings, if applicable.

Special Structural Requirements

See **Appendix Q** for special drawing and specification checklists for:

Cast-In-Place Reinforced Concrete,
Cast-In-Place Post-Tensioned Concrete,
Precast Concrete Components,
Structural Steel,
Steel Joists,
Pre-Engineered Metal Structures, and
Prefabricated Wood Components systems.

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Fire Protection (FP) Information (See Chapter 7)

Fire Detection and Alarm Systems (See Chapter 7)

Fire Suppression Systems - Sprinklers (See Chapter 7)

Fire Suppression Systems – Clean Agent (See Chapter 7)

Sprayed-on Fire Proofing Design & Specification (See Chapter 7)

Fire Pumps (See Chapter 7)

Smoke Control (See Chapter 7)

Plumbing Drawings.

- For renovation projects, provide (here or on cross-referenced demolition plans) plans showing demolition in sufficient detail that the work may be bid from the drawings.
- Plans of each floor noting fixture (including laboratory and compressed air outlet) locations and types of each.
- Plumbing fixture schedules showing designations, connection sizes, and mounting heights of handicapped fixtures. (Note that flush valve handles shall be located on the wide side of the handicapped enclosure.)
- Plans showing layouts and sizes of sanitary DWV piping, cold condensate drainage systems, floor drains, acid waste systems, neutralizing tanks, etc.
- Plans showing roof drains and areas served by each in square feet, piping and sizes. Show downspout boots and connections to foundation drains.
- Plans showing domestic hot and cold water systems, including piping sizes, domestic water heaters with expansion and storage tanks, backflow preventers, water hammer arrestors, water meters, relief devices, and valves including pressure reducing, isolation and balancing.
- Plans showing layouts and sizes of compressed air piping, air compressors, air dryers, drains, etc.
- Plans showing deionized water systems.
- Riser diagrams for sanitary drain, waste and vent; domestic hot and cold water; deionized water; and compressed air where the system is extensive. Risers shall be designated and keyed to the plans. Show room numbers where the outlets/inlets occur, and show drain fixture units at the base of each riser. Show sizes of water hammer arrestors.
- Details of hookups at water heaters, air compressors, etc., and roof drain installation.
- Schedules of water heaters, air compressors, air dryers, and drains.

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Mechanical (HVAC) Drawings

- For renovation projects, show demolition in sufficient detail that it may be bid from the drawings.
- Plans of each floor and roof showing double line-duct layouts, mechanical equipment location and layouts. Plans shall show ceiling-mounted lighting fixtures.
- Plans of each floor showing chilled water, heating hot water, steam and condensate piping and piping sizes. Show provisions for expansion. (This may be shown on ductwork plans where congestion is not a problem.)
- Provide layouts of mechanical equipment and fan rooms to a scale not less than twice that of the floor plans. Show equipment, ducts, piping, etc. to coordinate the installation in tight areas. Show access and service space requirements such as that required for tube, coil, and fan removal.
- Provide schedules for all mechanical equipment, steam traps, air devices, etc. showing sizes, capacities, HP, CFM, electrical characteristics, locations, features, etc.
- Provide drawings showing control schematics, automation points, etc.
- Provide schematic diagrams of chilled and heating water, steam, and condensate piping.
- Central heating and cooling plants, distribution piping, equipment, anchors, expansion joints, etc. shall be shown as necessary to clearly describe the work.
- Provide sections as required to clearly show the work in 3 dimensions.
- Show the building loads (in BTU or pounds of steam per hour) to include transmission plus infiltration, outside air, domestic hot water, and kitchen, laundry and hospital hot water and outside air loads that are supplemental to those mentioned where applicable.
- Indicate the sensible and total air conditioning load of the building in tons. Also show the outside air portion of the cooling load in tons.
- Provide details as necessary to show fittings for ducts.

Electrical Drawings

(Power and lighting plans may be combined if the combined drawing clearly conveys required information.)

- Lighting plans for each floor showing approximate fixture location, type, and lighting level required (in footcandles).
- Power distribution plans showing location of incoming service, generators, and panelboards.
- Show interface points for communications, fire alarm, EMCS and other pertinent systems.
- Floor proposed locations for receptacles, telephone outlets and switches.
- Electrical plans shall list in kilowatts, electrical load total, three-phase load, motor load, and size of largest motor in horsepower.
- Show required lighting levels in footcandles for the various areas.

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- Provide control diagrams, panel board schedules and riser diagrams.
- Provide Lighting Fixture Schedule on the drawings

Control Systems

- Provide a written sequence of operation for each mechanical and electrical control system stating explicitly how systems are to function.
- Give all pertinent data regarding safety, alarms, indicators, and control parameters.
- The sequence of operations may be shown on the control diagrams in lieu of in the specification.
- Provide control system diagrams.
- Indicate point(s) of connection of new to existing system.
- Indicate or describe location of operator interface (PC) unit.

808.7 Not Used

808.8 Specifications: All specification sections shall be written / edited to apply specifically to the project and shall not include materials, standards, requirements or data not pertaining to the project. Specifications shall conform to the requirements and standards listed in Section 803.

808.9 Rock Excavation: See Section 902.3 for requirements. Provide estimated quantities of rock excavation on the Bid Form.

808.10 The A/E shall prepare and submit Working Drawings and Specifications for the Agency to submit to the various review agencies for approval as pertinent to the project. (See Section 811.)

808.11 With this submission, the A/E shall furnish the Agency with an estimate of the time for constructing the project and include such in the appropriate paragraph of the Bid Form.

SECTION 809.0 BID FORMS AND PROCEDURES

809.1 Instructions to Bidders: Use the standard Instructions to Bidders, GS Form E&B CO-7a. Do not retype or modify the Instructions to Bidders, CO-7a, without permission from the Director of the Bureau of Capital Outlay Management. Information on where Bid Documents can be viewed and shipping charges, if any, should be placed in the Advertisement and Notice of Invitation for Bids.

809.2 Unit Price Bids: Unit Price Bids without estimated quantities shall not be requested on the Bid form. Unit prices may be used only where the required quantity cannot be reasonably determined by the bidders from the documents. (e.g. total length of piles required, total length of caissons, amount of rock excavation, etc.) See Section 900.6 for guidance on Unit Price Bids.

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In such case, an estimated quantity of the unit of construction is provided by the Agency (and its A/E) on the bid form; the quantity as provided on the bid form and the unit price inserted by the bidder are multiplied together to give a lump sum amount; and the lump sum amount is added with the other base bid amounts to determine the total base bid amount. Use the wording and format shown on the Sample Bid Form Format, DGS-30-220 in the Forms Center to allow an adjustment to the Contract Price based on the actual quantities provided and approved in the Work.

809.3 Bid Form Preparation: Bid Forms shall be prepared using the format and wording shown on the Sample Bid Form Format, DGS-30-220 in the Forms Center. The Bid Form shall state the basis for determining the low bidder for award of the contract as shown on the Sample Bid Form. The contractor's Disqualification Statement and the Immigration Reform and Control Act of 1986 statement shall be included on each bid form. See Section 810 of this Chapter for requirements and procedures concerning Additive Bid Items.

Including or use of "Allowances" in the Bidding is not permitted. Options are to specify the work in the documents and bid competitively with the rest of the project OR procure the work separately and include the subcontractor's name and price on the Bid Form similar to the method used for "HVAC monitoring" on Standard Bid Form Format DGS-30-220 .

809.4 Prequalification of Contractors or Subcontractors: As provided in §2.2-4306 of the *Code of Virginia*, prospective bidders may be prequalified for bidding on projects. (Prequalification criteria, procedures, and appeal process requirements are shown in Chapter 11 of the **Manual**.)

809.4 Advertising: The Agency shall notify the A/E in writing when final working drawings and specifications have been approved. The Agency shall establish a time and place for receiving bids. Bid receipt dates shall be coordinated through BCOM. The A/E shall use this information in completing the Advertisement, the 'Posting' and the Notice of Invitation For Bids.

For all work in excess of \$100,000, a minimum period of 30 days shall be allowed from date of the original advertisement / Posting of Notice to the date of bid receipt unless otherwise approved by the BCOM Director. Projects estimated to cost less than \$100,000 may be advertised for shorter periods of time such as 21 or 14 days (depending on whether more than one trade is involved) but no less than the 10 days required by the *Code of Virginia*.

§2.2-4301 of the *Code of Virginia*, "Competitive Negotiation", requires that Requests For Proposals (RFP) be 'posted' **and** advertised in the newspaper of general circulation in the area. If the agency determines that the work can be procured by competitive negotiation, it must advertise the RFP in the newspaper as well as public posting and posting on the DGS Internet procurement website, URL <http://vbo.dgs.state.va.us>.

§2.2-4301 of the *Code of Virginia*, "Competitive Sealed Bidding", requires that Invitations For Bid (IFB) be 'posted' **or** advertised in a newspaper or both. When advertising in the newspaper, the Agency may post the full Notice of Invitation For Bid (such as DGS-30-256) or it may use the 'short form' Notice posting the minimum information as shown in DGS-30-252 . Notice shall also be posted on the DGS Internet procurement website, URL <http://vbo.dgs.state.va.us>.

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The Agency may authorize the A/E to advertise in the newspaper in the name of, and at the expense of the Agency, for construction bids in accordance with provisions of §2.2-4301 the *Code of Virginia*.

The IFB advertisement shall, as a minimum, include the information indicated on the “Sample Advertisement Format” shown as form DGS-30-252 on the Forms Center. Newspapers which are considered to have daily statewide circulation in Virginia are the Richmond Times-Dispatch, the Norfolk Virginian-Pilot, the Roanoke Times & World News and the Washington Post. The project may also be advertised in a newspaper which serves the area where the project is located if different from the above. A Notice of the Invitation For Bids shall be posted in a designated public area used for posting of such notices. For optimum exposure, the advertisement should also be filed with all organizations that regularly advertise and report construction bid data. Advertisements in other newspapers may be advantageous for large projects.

809.5 Virginia Business Opportunities (VBO): The project shall be posted on the On-Line Bids page of eVA, Virginia's central electronic procurement website. The URL is <http://vbo.dgs.state.va.us>.

809.6 eVA Registration

eVA BUSINESS-TO-GOVERNMENT VENDOR REGISTRATION: The eVA Internet electronic procurement solution, web site portal www.eva.state.va.us, streamlines and automates government purchasing activities in the Commonwealth. The portal is the gateway for vendors to conduct business with state agencies and public bodies. All vendors desiring to provide goods and/or services to the Commonwealth shall participate in the eVA Internet e-procurement solution either through the eVA Basic Vendor Registration Service or eVA Premium Vendor Registration Service. **All bidders or offerors must register in eVA prior to the award of a contract for construction or architectural/engineering services.**

- a. eVA Basic Vendor Registration Service: \$25 Annual Fee plus a Transaction Fee of 1% per order received. The maximum transaction fee is \$500 per order. eVA Basic Vendor Registration Service includes electronic order receipt, vendor catalog posting, on-line registration, and electronic bidding.
- b. eVA Premium Vendor Registration Service: \$200 Annual Fee plus a Transaction Fee of 1% per order received. The maximum transaction fee is \$500 per order. eVA Premium Vendor Registration Service includes all benefits of the eVA Basic Vendor Registration Service plus automatic email or fax notification of solicitations and amendments, and ability to research historical procurement data, as they become available.

The following statement must be included in the Invitation For Bids, preferably in the “Notice of Invitation to Bid” that is posted and included in the bid documents:

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“eVA BUSINESS-TO-GOVERNMENT VENDOR REGISTRATION: The bidder or offeror must be a registered vendor in eVA to be awarded this contract. Bidder must include the cost of the eVA transaction fee in its bid.”

SECTION 810.0 ADDITIVE BID ITEMS

The A/E is responsible for the development and design of the project to meet the scope and to be within the Design Not to Exceed Construction Budget identified in the A/E contract. The Work included in the Total Base Bid shall provide a complete and functional facility meeting all Code, accessibility and safety requirements.

When the project cost estimate indicates that the Total Base Bid for the project scope may not be within the available funds, the Agency and A/E should consider what features would be negotiated out if bids are over budget and include that Work as Additive Bid Items for cost or budget control. After the Agency and A/E have incorporated reasonable cost containment measures in the design, Additive Bids Items may, with the approval of the BCOM Director, be used for budget control subject to the following limitations:

- When additive bid items are approved for use, a maximum of four (4) Additive Bid Items may be included. Such Additive Bid Items are not intended to be a pricing exercise for the bidders.
- The total cost estimate of the Total Base Bid plus all Additive Bid Items **shall not exceed 110%** of the 'Construction Cost' on the CO-6 for Capital Outlay Projects or 110% of the Budget for Non-Capital Projects
- Additive Bid Items shall be structured to minimize additional effort necessary to prepare the bid.
- Additive bids shall not be used to provide essential elements of the project, such as connection to water supply, required lighting levels, or adequate HVAC capacity, or Work without which the building would not be habitable, functional or safe.
- The Work/Design as described in the Base Bid shall be of the level of quality required for the project. Additive bids shall not be used as a shopping list to upgrade, substitute for, or delete for credit any part of the Work included in the Base Bid.
- Only the term Additive Bid Item shall be used. Use of the term 'Alternate' is not permitted.
- The Work included in each Additive Bid Item shall produce a complete component which may be incorporated into the work in the Base Bid.
- Each Additive Bid Item shall be independent of other Additive Bid Items.
- None of the Additive Bid Items shall compromise the work in the Base Bid and other Additive Bid Items for compliance with Code, accessibility or safety requirements.
- Additive Bid Items shall be sequenced so the most essential Additive is listed first

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- When the project bids are received and opened, the low bidder shall be determined based on the lowest **cumulative** bid for the Total Base Bid plus the total amount of the Additive Bid Items, taken in sequence as the Owner in its sole discretion decides to accept/award.
- Out-of-sequence selection of Additive Bid Items is prohibited, even if such manipulation would fit within the available funding.
- **Negotiation of Additive Bid Item amounts is prohibited.** Negotiations are allowed only for the Base Bid Work. If negotiations are required to allow the award of the Base Bid, the inclusion of any of the Additive Bid Items in the contract may not be considered in discussions during the negotiations, even if the negotiations of the Base Bid amount would yield sufficient savings to include an Additive Bid Item. Permission to negotiate with the low bidder must be obtained from the Director, Bureau of Capital Outlay Management.

SECTION 811.0 PROJECT SUBMISSION REQUIREMENTS

811.1 Capital Project Submittals

The A/E shall provide adequate copies of plans, specifications, cost estimates, and other applicable data for the Agency's use and for review by other applicable reviewing agencies. Submissions for building projects are indicated below and shall be adjusted as appropriate for a particular project:

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<u>Usual Reviewing Agency</u>	Number of copies usually required					
	<u>S</u>	<u>P</u>	<u>WD</u>	<u>RWD</u>	<u>BID</u>	<u>ADDENDA/</u> <u>Change</u>
BCOM / Building Official Change Orders for USBC regulated work	4	5	5	5	2	2 2
Regional Fire Marshal Office Change Orders for USBC regulated work	—	1***	1***	1***	1#	1 1
DCR (Division of Soil and Water Conservation) (Erosion and Sediment Control - 4 copies *) (Stormwater Management - 4 copies *)	—	—	4*	—	—	
<u>Other Review Agencies</u>	<u>S</u>	<u>P</u>	<u>WD</u>	<u>RWD</u>	<u>BID</u>	
Art and Architectural Review Board	X	X	—	—	—	
Department of Historic Resources		2*	—	2*	—	—
Health Department (Food Service)		—	2*	—	—	—
Department of Environmental Quality (Air Division)		1*	1*	1*	—	—
Department of Environmental Quality (Water Division)		—	1*	1*	—	—
Department of Environmental Quality (Waste Division)		—	**	**	—	—
County or City Manager		—	1##	—	—	—
Chesapeake Bay Local Assistance Department		-	-	2*	-	—

Legend: S = Schematics P = Preliminaries
WD = Working Drawings or Resubmitted Working Drawings
RWD = Resubmitted Working Drawings BID = Bid Documents, including Addenda
Change Orders for any work regulated by the USBC shall be reviewed by BCOM
X Presentation to Board
* Pertinent parts or sections of documents only required to be submitted
** Submit data and dump location request for all asbestos-containing material or other hazardous waste materials resulting from renovation or demolition.
*** For renovation projects only where there is no change in Use Group classification or change within Use Group classification
Send one copy of all bid documents, addenda and Changes for both new construction and renovation projects to the regional Fire Marshal's Office.

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When requested by the City/County Managers, send one copy of Preliminary Drawings

The A/E shall coordinate with and obtain approval of the utility designs from the local utilities agencies for connection and service. The A/E shall coordinate with local Fire Service entity for locations of on-site hydrants and Fire Department Connections.

The A/E shall coordinate with and shall obtain approval of the entrance design and any required turn lanes or transitions from the District Engineer of the Virginia Department of Transportation for entrances to the project site.

If asbestos projects are authorized to proceed with working drawings, two copies are required, and an additional two if revision and resubmission is necessary.

811.2 Non-Capital Project Submittals

The A/E shall provide adequate copies of plans, specifications, cost estimates, and other applicable data for the Agency's use and for review by other applicable reviewing agencies. Submissions for building projects are indicated below and shall be adjusted as appropriate for a particular project:

<u>Usual Reviewing Agency</u>	<u>Number of copies usually required</u>					
	<u>S</u>	<u>P</u>	<u>WD</u>	<u>RWD</u>	<u>BID</u>	<u>ADDENDA/</u> <u>Change</u>
BCOM / Building Official	(4 Optional)		5	5	2	2
Change Orders for USBC regulated work						2
Regional Fire Marshal Office	—		1***	1***	1#	1
Change Orders for USBC regulated work						1
DCR (Division of Soil and Water Conservation) (Erosion and Sediment Control - 4 copies *) (Stormwater Management - 4 copies *)	—	—	4*	—	—	
<u>Other Review Agencies</u>	<u>S</u>	<u>P</u>	<u>WD</u>	<u>RWD</u>	<u>BID</u>	
Art and Architectural Review Board		X	—	—	—	
Department of Historic Resources		2*	—	2*	—	—
Health Department (Food Service)		—	2*	—	—	—
Department of Environmental Quality (Air Division)			1*	1*	—	—
Department of Environmental Quality (Water Division)	—		1*	1*	—	—
Department of Environmental Quality (Waste Division)	—		**	**	—	—

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County or City Manager	–	1##	–	–	–
Chesapeake Bay Local Assistance Department	-	-	2*	-	–

SECTION 812.0 REVIEWS AND APPROVALS

812.1 General: Reviews are performed as a service to the Agency and do not relieve the Agency, its A/E, or its Consultant from compliance with all codes, laws, rules, regulations, directives and standards applicable to the project whether or not cited in the review. Section 813, Quality Control/Quality Assurance, describes Q/A requirements for A/E's for Capital Projects before submitting Working Drawings and subsequent submittals.

812.2 Building Official Review: The Director, Division of Engineering and Buildings (DEB), as Building Official for all buildings on state property is responsible for the review of the working drawings / bid documents to assure conformance with the requirements of the VUSBC, the Handicapped Accessibility, and other DEB Standards established for construction and/or modification of State Owned Buildings. The Bureau of Capital Outlay Management (BCOM) is the DEB Director's staff tasked with performing these reviews. See Chapter 12 for Building Official information.

When the Building Official is satisfied that the documents are in conformance with all applicable USBC and CPSM Chapter 7 requirements, a Building Permit, G.S. Form E&B CO-17, will be issued to the Agency.

812.3 Annual Permit Work: See Appendix P, "Building Permit Policy for Construction – State Owned Buildings & Structures" for guidance on the types of Work which may be performed by the Agency under the Annual Permit. The Agency Representative designated on the permit shall be responsible to the Building Official for review & approval of documents, issue of a Project Permit, and inspection of the Work for conformance with VUSBC requirements. See Chapter 12 for information on the Annual Permit Representative.

812.4 BCOM Review Comments: BCOM will transmit its review comments to the Agency in one of the following ways:

812.4.1 By written comments referencing the applicable page, detail, etc. Within 2 weeks after receipt of written comments from all applicable disciplines, the Agency, with input from the A/E, shall provide a written response to each BCOM comment, preferably on the comment sheet in the space provided or on a separate page if additional space is needed. All issues in dispute shall be resolved before the authorization is given to proceed to the next phase.

812.4.2 By a meeting /conference at BCOM where the Agency (and the A/E) are invited to discuss written comments and/or marked-up plans and specs and to discuss critical issues noted during the review. This method may be required by BCOM where it is expedient to identify the general types or nature of deficiencies, especially if a resubmittal will be required. The proposed actions and decisions

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reached in the meeting will be accurately recorded in writing by the Agency, or it's A/E, and distributed to all meeting participants within five (5) work days after the meeting.

812.4.3 Final approval of the working drawings / bid documents is based on the understanding that the A/E has complied, or certifies that it will comply, with the foregoing and with all review comments concerning these requirements prior to printing the documents for release to bidders.

812.5 Resubmittals: Submittals which are incomplete, which require extensive revisions, and/or which do not conform to the requirements of the **Manual** shall be properly completed and resubmitted for a new review. The A/E may be required to make such resubmittals without compensation or reimbursement.

812.6 Revised Submittals: All changes, revisions, and additions shall be highlighted in yellow on at least two revised submittal set of preliminaries or working drawings. If an Agency asks for a review to be expedited, all changes shall be highlighted in yellow on all sets of the revised submittal unless otherwise agreed to by BCOM.

812.7 Print and Release of Bid Documents:

812.7.1 All review comments shall be resolved and the documents shall be revised / corrected before the documents are released for printing. **Using multi-page addenda to address/resolve working drawing review comments IS NOT ACCEPTABLE.**

812.7.2 When revisions to the documents are complete in accord with BCOM, Fire Marshall, and other agency review comments, revised plans and specifications (with all changes, revisions, and additions highlighted in yellow on at least two of the sets) shall be submitted to BCOM for review.

812.7.3 When authorized to advertise for bid by the approved C0-6, other CO forms, or by the BCOM Director, contact the Program Management Section at (804) 225-3769 to establish a bid receipt date.

812.7.4 Complete and coordinated documents, checked and sufficiently detailed to provide bidders and builders with a clear description of the Agency project requirements will be the key to gaining approval to print/release documents for bidding.

812.7.5 Clarification and corrective data shall be included in addenda to those documents issued at least 10 days prior to the date set for receipt of bids. **Two copies of each addendum shall be sent to BCOM at the same time that it is issued to bidders.**

812.8 Advance Advertisement/Notice: In some cases it may be advantageous to the Agency to advertise a project before bid documents are fully revised. In such case the procedures below shall be followed:

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If Advertisements are authorized to be placed in the VBO and newspapers before bid documents are approved for printing and release, the Advertisement shall indicate:

“Bid documents will be available to bidders on or about ____ (date) ____.”

The bid date shall be set to allow reasonable time to complete revisions, to review and print the documents, to issue the documents, and to give bidders at least three weeks to prepare bids.

- 812.9 Review Times** The following review times will be the goal for each Review Agency unless
- (1) the submissions are obviously incomplete, (in which case the Submitting Agency shall be notified when the inadequacy is noted) or
 - (2) the Review Agency has some unusual circumstance which would cause the review times to be exceeded, in which case that circumstance shall be documented.

The review time indicated below is intended to be the average log in to log out time for all projects, regardless of size. Further, all Review Agencies will follow the usual practice of the Division of Engineering and Buildings in indicating approval of a stage of planning subject to inclusion of the recited review comments in the next stage of plans development. Note that the indicated review turnaround times are exclusive of Holidays, State Office Closings, and the two week downtime for the Christmas and New Years Holiday period.

This will be applicable to schematic and preliminary submittals also. In the case of working drawings, the review comments shall be incorporated in the plans and specifications prior to submittal of revised working drawings or to issuing the documents for bid.

Average Review Periods for Complete Submittals

Division of Engineering and Buildings – less than 3 weeks

(Goal is 85% reviewed in 14 days and 95% in 21 days)

Fire Marshal's Office - 3 weeks

The Department of Historic Resources - 3 weeks

The Division of Soil and Water Conservation - 3 weeks

The Department of Health - 3 weeks

The Art and Architectural Review Board receives presentations from Agencies at its normal monthly meeting (usually the first Friday of each month) and makes recommendations to the DGS Director.

- 812.10 Approvals:** Approval of the submittal at any stage is dependent on the Agency and the A/E satisfactorily resolving the issues raised during the reviews by DEB/BCOM and other pertinent review agencies. Approval of Preliminaries on any project for which a Value Engineering Study is required will be dependent on the successful resolution of the Value Engineering recommendations and the DEB/BCOM review comments.

SECTION 813.0 QUALITY CONTROL / QUALITY ASSURANCE

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813.1 The A/E shall be responsible for the professional and technical accuracy and coordination of all designs, drawings, specifications, cost estimates, and other work or materials furnished. Detailed criteria for coordination and quality assurance of the plans and specifications are shown in Chapter 9.

813.2 The A/E shall perform a Quality Assurance review of the working drawings prior to submitting the working drawings to DEB/BCOM. See Appendix Q for Checklists and guidance for QC/QA reviews and coordination of plans and specifications.

813.3. The first sheet of the plans and specifications submitted to BCOM and to the Owner for Working Drawing Review shall contain the following statement signed by the responsible A/E:

“A Quality Control/Quality Assurance check has been made on this project’s documents and corrections have been made. The undersigned states that these plans and specifications submitted for review are complete and ready for bidding.”

Signed: _____
(Type Name & Title)

This statement shall not appear on the sets of documents issued to bidders.

SECTION 814.0 VALUE ENGINEERING (VE)

814.1 General: Capital Projects with an estimated construction cost greater than \$5,000,000 shall have a 40-hour Value Engineering (VE) Study conducted on the design. (See §2.2-1133, *Code of Virginia*.) The study shall be conducted by a qualified VE Team concurrent with the preliminary (40%) design review utilizing the five-step job plan as recognized by the Society of American Value Engineers (SAVE). A presentation of the study results shall be made to the Agency.

814.2 Scope of VE Study: The VE Study shall be made by a multi-discipline team of five VE qualified professionals meeting on five consecutive work days. The study group will follow the five step job plan as recognized by the Society of American Value Engineers (SAVE). The VE report (15 copies unless shown otherwise in the RFP) shall encompass the recommendations of the VE study group and include detailed cost estimates, life cycle analysis and sketches, as necessary.

The VE Team shall be assembled and isolated away from their normal work station in order to avoid the normal daily interruption. The Agency will provide a suitable room with tables

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and chairs. VE services shall be performed in a timely manner concurrently with the normal preliminary design review to minimize any delay in the schedule.

814.3 Procurement of the VE Study: The agency shall procure the services of a Value Engineering consultant using professional services RFP procurement procedures. The procurement process should begin at least 90 days prior to the anticipated date the preliminary drawings will be submitted. RFP evaluation factors shall include the experience, qualifications and expertise of each proposed team member.

The VE response to the RFP shall include the proposers list of proposed and alternate team members and their respective resumes representing their various disciplines/areas of expertise, together with the certified (CVS) team leader's qualifications and discipline shall be submitted with the proposal and approved at the time of negotiations. Changes to or substitutions to the approved VE team configuration shall be submitted in writing to the Agency for approval.

The typical VE Team will be composed of

- a. VE Team Leader (CVS)**
- b. Architect
- c. Structural Engineer
- d. Mechanical Engineer
- e. Electrical (or Civil) Engineer
- f. Typing, Clerical and Estimating support staff as necessary

** The principle person responsible for prestudy work, assembling, editing and reproducing the recommendations generated by the Value Engineering Team Study. C.V.S. must edit and sign the final report.

814.4 Qualifications of VE Team: The VE proposer/consultant shall provide one team consisting of a Certified Value Specialist Team Leader and at least one licensed architect and one licensed professional engineer from each discipline which have significant work on the project, usually one each of structural, mechanical and electrical engineers. VE Team members shall be experienced designers who are separate and completely independent from the Project A/E & its consultant firms.

The VE Study shall be coordinated, supervised and led by a person having Certified Value Specialist (CVS) credentials that qualify him/her to perform such services. The CVS shall be certified by the Society of American Value Engineers and shall have had a minimum of eight years combined college education and practical on-the-job VE experience. Practical experience is considered to have been gained by being actively engaged as a consultant in VE activities.

Members of the team shall be registered architects and professional engineers licensed in the Commonwealth of Virginia. All shall have a good understanding of VE principles and methodology as evidenced by attending a certified forty hour workshop. Team members shall

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be knowledgeable of the design and operational requirements and characteristics of the systems applicable to their discipline and the type of facility being studied.

814.5 Information Supplied to the VE Team: Prior to commencing the VE study, the A/E will forward the following information to the VE Team:

- (a) Two sets of 35% drawings (full size)
- (b) Four sets half size drawings
- (c) Outline Specifications & Systems Checklists (2 copies)
- (d) Detailed Cost Estimate (6 copies)
- (e) Basis of design (6 copies)
- (f) Design Calculations (Structural, Mechanical, Electrical)
- (g) Boring logs and soil reports
- (h) Scope of Project/Program requirements (6 copies)

814.6 Certified Value Specialist (CVS) Responsibilities: The CVS shall have the following responsibilities for the VE Study:

- a. Pre-Study
 - (1) Review complete design package & identify high cost areas.
 - (2) Prepare cost model (actual vs. historical)
 - (3) Prepare bar graphs of all sub systems.
 - (4) Prepare preliminary cost worth ratios.
- b. 40 Hour Study
 - (1) Team Leader and coordinator.
 - (2) Team recorder.
 - (3) Presentation of recommendations.
- c. Post Study
 - (1) Write and assemble report.
 - (2) Proof all VE recommendations, especially the cost estimate and life cycle analysis.
 - (3) Calculate redesign effort for each recommendation in manhours.
 - (4) Sign and submit final report within 7 days. Express mail 10 copies to the Owner and 5 copies to A&E of record.

814.7 VE Report Requirements: The results of the VE study performed on the project shall be documented as follows:

- (a) Contents page.
- (b) Brief description of total project and project requirements with a copy of the Owner's program requirements.
- (c) Brief summary of VE recommendations.
- (d) One site plan, floor plan and elevation on 8-1/2"x 11" or fold out.
- (e) Summary sheet (only) of 35% cost estimate.
- (f) VE cost model of project.

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- (g) Each VE recommendation will be described Before and After VE and will be accompanied with a detailed cost estimate of savings, life cycle cost analysis, and sketches as necessary.
- (h) Complete 5 step job plan (worksheets) of all work will be submitted as appendices for reference.

All reports must be systematically assembled and must be short and concise, yet informative enough for decision making. VE Reports shall be prepared and submitted on 8-1/2" x 11" bond paper and bound under hardback cover appropriately identified. Sketches may be 8-1/2" x 11" or fold-out. Pages must be sequentially numbered in the lower right hand corner to facilitate assembly. Tabs should be used for quick reference of important sections of report.

814.8 Oral Presentation: At the completion of the Value Engineering Study, the VE team leader and members as appropriate shall make an oral presentation of the items recommended to be implemented on the project. Audience for the presentation will include representatives of the following: the A/E , the Agency, and the DGS .

814.9 A/E Participation: The design A/E's involvement in the VE Study with anticipated manhours by discipline for routine general construction is summarized as follows:

	PM	ARCH	STRUCT	MECH	ELEC	CIVIL
• A/E Design Team Present Over-view of Design Concept	4	4	4	4	4	(4)
• A/E Design Team supports, reviews, & Supplements VE Effort	4	4	4	4	4	(4)
• Oral Presentation of VE Study Results to Agency	4	4	-	-	-	-
• A/E Review, Supplement, and Comment on VE Report to Agency	8	4	4	4	4	(4)
	PM	ARCH	STRUCT	MECH	ELEC	CIVIL
• Follow-up on Questions/ Decisions from Oral Presentation	4	-	-	-	-	-
MANHOUR TOTALS	24	16	12	12	12	(12)

The design A/E responsibilities include the following:

- Present an overview of the project criteria and development to the value engineering team.

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- Provide comments on the VE study report to the Agency within 14 days of receipt of the report.
- Participate in joint 35% review/VE resolution meeting at the Agency and at BCOM if required.
- Submit a final report within 14 calendar days of the resolution meeting to the Agency and BCOM. Implement all finally accepted VE recommendations into the project design.

814.10 Criteria Challenge: In the package of documentation which the design A/E prepares for the Value Engineering Consultant, the design A/E may include a Criteria Challenge Package to question specific project design criteria, instructions and/or user requirements and to identify alternate items or procedures that might satisfy the **required functions** at a lower life cycle cost.

Examples of criteria which might be challenged are the exterior appearance or materials which may have resulted from a visit to the AARB, the Energy Budget required by the **Manual**, a user requirement for every office to have a window, or a user criteria for square footage in spaces which exceed that necessary for the space function.

Each challenge must include Code references, a life cycle analysis supported by recent research and testing, and any calculations that are necessary to support the challenge. A brief narrative describing the advantages, disadvantages and magnitude of potential savings shall be included as well.

The Criteria Challenge Package with the documentation provided to the Value Engineering Consultant shall be marked **VALUE ENGINEERING** and submitted with the Preliminary Submittal to BCOM. However, project development will be based on current standards until such time as a formal approval is received for any waiver or deviation from codes, standards or **Manual** requirements.

814.11 A/E Action on VE Study: The following clarifies the specific submittals and approval procedures required for the VE Study responses and proposed action:

- Both the Agency and the Architect/Engineer (A/E) shall review and evaluate the Value Engineering recommendations. Not all VE recommendations are automatically appropriate for inclusion in state projects.
- The A/E shall provide a written comment and/or evaluation of each VE recommendation to the Agency along with **the A/E's recommendation to accept, to reject, or to accept with modifications** each VE recommendation. The A/E shall also provide its responses to the Bureau of Capital Outlay Management (BCOM) preliminary review comments so that the VE recommendations and the BCOM comments may be resolved at the same time.
- The A/E shall provide justification for rejection of, or modification to, any VE recommendation.

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- The A/E shall prepare a Summary of Value Engineering Recommendations using the Format VE-1 in Appendix C (electronic version downloadable from the DGS website) and indicate its recommended disposition of each item. The A/E's completed electronic VE-1 Summary sheet shall accompany the detailed responses / explanations sent to the Agency.
- The Agency shall review the A/E's evaluation and recommendations on the VE Study and the A/E's responses to the BCOM review comments. The Agency shall indicate its proposed action (acceptance, rejection, or acceptance as modified) on the electronic VE-1 Summary sheet and forward electronic copies of the VE-1 to DEB along with printed copies of the VE Study.
- If any proposed action deviates from the requirements of the Virginia Uniform Statewide Building Code (VUSBC) or the **Manual**, the Agency shall also submit a request for code modification or waiver of **Manual** requirements for each item along with appropriate justification.
- The Bureau of Capital Outlay Management will review the responses to the BCOM review comments and the proposed action on the VE recommendations. A meeting of BCOM and Agency representatives will be required where the agency has rejected a VE recommendation for a design change that was also identified in the BCOM review or is judged by BCOM to meet the criteria of the project and save money. Upon resolution of the issue and agreement on a specific design direction, the CO-5 will be approved and authorization given to prepare working drawings.

SECTION 815.0 STRUCTURAL AND SPECIAL INSPECTIONS

- 815.1** The VUSBC in Chapter 1 prescribes the minimum inspections to be performed on a project. The VUSBC also adopts the International Building Code by reference. USBC Chapter 17, Structural Tests and Inspections prescribes certain tests and inspections which are required to be performed on the structural systems for the building. These inspections have been, heretofore, provided on state projects by a combination of the Owner's Project Inspection, the A/E and the Owner's Independent Testing Lab.
- 815.2** The Director, Division of Engineering and Buildings, in his capacity as Building Official for all State-Owned buildings establishes the following procedure for the application of the Structural and Special Inspections for capital outlay projects.
- 815.2.1** The A/E, as part of its Basic Service of preparing bid documents, shall include in the project specification the requirements for the materials, for the submittals, and for the tests and inspections to be performed. Identify those tests and inspections to be performed by the Owner's Independent Testing Service and require all other tests to be performed and paid for by the Contractor. The A/E shall include a summary of required Structural and Special Inspections in Division 1 of the Specifications.

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815.2.2 The A/E, as part of its construction period Basic Services, shall review and approve the shop drawings, material submittals and other data required to assure compliance with the requirements of the bid documents.

815.2.3 Each project shall have an on-site Project Inspector/Clerk of the Works who shall, as part of his responsibilities, check all materials delivered of the site for conformance with the approved submittals. The Inspector shall also check the installation for proper materials, methods, clearances, etc., as described in the plans and specifications and in the approved submittals.

815.2.4 The Owner's Independent Test Lab shall inspect foundations, log and inspect pile and caisson installations, inspect and test concrete, and inspect and test bolted and welded connections as required by the specifications.

815.2.5 The A/E in accord with their contract shall visit the site with representatives of each discipline having work in progress to assure conformance with the design shown in the documents. Where an Agency has received permission to exclude this service from the A/E contract, qualified Architects and Engineers of the Agency shall perform this function.

815.2.6 The Owner's Project Inspector and the Owner's Test Service shall furnish copies of all reports to the A/E.

815.2.7 The Agency shall submit with the CO-6 two (2) copies of the completed and signed G.S. Form E&B CO-6a Statement of Structural and Special Inspections, with copies of the edited schedule for Special Inspections - State-owned Buildings.

815.2.8 The Agency shall submit two (2) copies of the completed and signed Final Report of Structural and Special Inspections, G. S. Form E&B CO-13.1b with its request for a Certificate of Occupancy.

815.3 Appendix M, Structural and Special Inspections, contains the list of Structural & Special Inspections required for State-owned Buildings. The A/E shall edit the applicable list as necessary to indicate those materials and inspections which are and are not required for the project.

815.4 See **Chapter 10 and Appendix N** for additional information on other Project Inspector functions.

SECTION 816.0 "COMMISSIONING" OF HVAC SYSTEMS

"Commissioning" for HVAC systems, as described in ASHRAE Guideline 1-1989 for Commissioning of HVAC Systems, begins with the development of the project criteria, continues through the design of the HVAC systems including preparation of the plans and specifications describing the HVAC system components and requirements, continues through the review of shop drawings and submittals, continues through the inspection of the installations of the systems and

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observation of applicable tests and concludes with the final testing, balancing, start-up, initial operation, and acceptance of the HVAC system including controls. The A/E must begin at the project inception to develop an orderly process to document and set forth the various elements of the process so that the commissioning criteria and requirements are integrated with the design and the specification of the HVAC system and so that procedures are defined for the required testing, balancing and operational checks.

The A/E shall specify Contractor requirements related to prefunctional performance testing including, but not limited to, pressure tests, flushing, cleaning, testing, balancing, adjusting and start-up of equipment and the calibration and testing of automatic controls. The specifications shall require that every mode of every part or zone of the HVAC system is operated under full and part load and through all normal operational modes. The specifications set forth the procedures and requirements for the performance testing, system acceptance and training of agency personnel if required.